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Multi-stakeholder dialogue on sustainable energy and transport

Note by the Secretary-General

Addendum

Discussion paper contributed by the non-governmental organizations*

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* Prepared jointly by the Commission on Sustainable Development NGO Energy and Climate Change Caucus and NGO Transport Caucus; the views and opinions expressed do not necessarily represent those of the United Nations.

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Introduction

1. The energy and transport sectors constitute the two major sources of greenhouse gas emissions and other environmental contaminants. For many years, governments have heavily subsidised unsustainable forms of transport and energy, with commensurate growth in demand and increasingly disastrous implications for the global environment. In both sectors, the solutions to these problems, locally and globally, must now be based on a fundamental reorientation towards reduction in consumption and a shift of government subsidies towards support for sustainable energy and transport policies, strategies, and technologies, and targeted support for disadvantaged, low-income sectors in all countries. Four key issues are discussed in this paper, with the two energy sections prepared by the CSD NGO Energy and Climate Change Caucus, and the two on transport prepared by the CSD NGO Transport Caucus. For more information about the two Caucuses, please go to the website: http://www.csdngo.org/csdngo.

Topic 1: Achieving Equitable Access to Sustainable Energy

2. **Sustainable Energy Has Minimum Negative Social, Health and Environmental Impacts.** Sustainable energy can ideally be defined as energy with positive impact on the healthy functioning of ecological systems, including the global ecosystem. At this point of time on earth, when few forms of energy can be regarded as 100% "sustainable", it may be useful to consider a working definition of sustainable energy as energy with minimum negative social, health and environmental impacts, and which can be supplied continuously to future generations on earth. Sources of energy and energy strategies can be divided into three categories: most sustainable, fairly sustainable, and unsustainable. Energy conservation, that is, reducing or preventing energy use, is certainly the most sustainable energy strategy. Certain renewable forms of energy are very or fairly sustainable. Examples of these include certain kinds of solar energy, wind energy, micro-hydropower, and biomass. Most NGOs would consider nuclear power, fossil fuels, large-scale hydropower, and large-scale use of forests for fuelwood to be unsustainable.

3. **The Current Situation: Inequity and Unsustainability**. The present situation regarding energy is one of inequity and unsustainability. Nearly two billion people, mostly in rural and low-income areas, lack adequate access to any kind of "modern" energy for electricity, cooking or heating. Fuelwood or other traditional biomass is still the main source of energy for many of these people, but the continued use of forests for fuel leads to further degradation of important ecosystems, plus destruction of sinks and increases in various emissions harmful to human health and the atmosphere.

4. At the same time, over-consumption and waste of energy resources has been occurring for a long time in industrialised countries, and now is a growing trend in industrialising sectors in developing countries. Unsustainable forms of energy have negative impacts on air, water, and land resources, plus related negative social and health impacts on humans and the ecosystems on which we all depend for our lives. For instance, besides potentially devastating impacts on climate change from carbon dioxide emissions, the burning of fossil fuels emits dangerous pollutants like mercury, lead, cadmium, sulfur dioxide, and nitrogen oxide; and the production, transport, and use of petroleum pollutes groundwater drinking supplies, soil, and the earth's oceans.

5. **The Future: Equitable Access to Sustainable Energy**. Nevertheless, the lack of access to sustainable energy by the vast majority of people on earth, in both industrialised and developing countries, provides an opportunity for all to move forward together toward a sustainable energy future. Such an equitable, sustainable energy future should have as its basis transparent energy decision-making processes with diverse participation. It would focus on very sustainable energy strategies and technologies, especially conservation and sustainable renewable forms of energy.

6. Energy influences many sectors related to development, and sustainable energy is crucial for sustainable development. The goal of governments, intergovernmental bodies, and all groups in civil society should be to ensure the availability of sustainable energy for all, both for communities now relying on unsustainable forms of energy, and for low-income and rural

communities that lack "modern" forms of energy. This goal can be best achieved by a combination of, one, governmental and civil society policies that promote sustainable energy production and consumption; and two, strong leadership by both in implementing and disseminating sustainable conservation and renewable energy strategies and technologies that already work well, especially in local communities.

7. **Action: Support Targets, Timeframes and International Cooperation in All Actions**. Governments, intergovernmental bodies, and major groups in civil society should set targets and timeframes between 2002 and 2010 for achieving all the policies and actions proposed below. All stakeholders should cooperate to facilitate the implementation of such policies and actions in order to achieve targets within the established timeframes.

8. **Action: Support Institutionalising Participation by Under-represented Groups in Energy Decision-making**. The poor, women, indigenous peoples, the disabled, youth, and low-income workers and the elderly, and other under-represented groups in civil society, should have key, institutionalised roles in energy decision-making at all levels and in all sectors, public and private. Active participation of these groups should be encouraged in all sectors producing and using energy. Participation by these groups in energy decision-making should be accompanied by initiatives in capacity building to promote linkages, networking, and understanding.

9. **Action: Support Information Access and Transparency in Energy Decision-making**. Energy decisions should be made in a totally transparent manner, including complete information access for the public. This should apply to all energy decisions by governmental and intergovernmental bodies in which public funds will be expended. But because energy policies and actions affect ecosystems and human, social and environmental health so drastically, such transparency and information access should also apply to private companies receiving any kind of government support, such as tax benefits, use of public lands, or other "subsidies".

10. **Action: Integrate the Concerns of Indigenous Peoples in Energy Land Use Decisions**. Indigenous peoples and their lands in a multitude of areas around the world have for many years been especially negatively impacted by production of unsustainable forms of energy, such as

fossil fuels, large hydropower, and nuclear power. Therefore, it is essential that indigenous peoples should have key roles in energy decisions that affect their peoples and lands.

11. **Action: Integrate Gender Equity into All Energy Policies and Programmes**. The active participation of women should be encouraged in all sectors producing and using energy, in order to bring about gender perspective and gender equity in energy policies and programme planning and implementation. Energy consumption places inequitable burdens upon women, especially in rural areas in developing countries. For instance, women spend long hours gathering cooking fuel, time that could be spent in more productive activities. The use of wood, coal, crop residues and animal wastes for cooking by women expose them to high levels of pollutants, with the result that women suffer inequitable shares of disease and premature deaths.

12. **Action: Integrate Workers' Concerns about Occupational Health and Safety and Job Re-training into Energy Policies and Programmes.** Workers in energy industries are particularly subject to serious occupational safety and health hazards, and workers' representatives should have an active role in energy decisions. Worker concerns regarding occupational safety and health should be integrated in all energy decisions. Workers in unsustainable energy industries should receive preference and assistance for re-training for jobs in industries producing or consuming sustainable energy or sustainable products.

13. **Action: Phase Out Harmful Subsidies**. The primary obstacle to the use of more sustainable forms of energy is the enormous amounts of government economic subsidies that perpetuate the myths of "cheap" fossil fuels and large-scale hydropower or "clean" nuclear power. Estimates of such economic subsidies on a worldwide basis are in the range of hundreds of billions of U.S. dollars per year. In fact, the true total is much higher, since these estimates do not include provincial/state government subsidies and many indirect infrastructure subsidies. Meanwhile, subsidies for much more sustainable renewable forms of energy such as solar and wind have not received even 1% of the subsidies that unsustainable forms of energy have.

14. Government subsidies for the production and consumption of harmful, unsustainable forms of energy should be quickly phased out. Some examples of government policies that are usually

considered economic "subsidies" are: deficiency payments for producer losses; operating grants to producers; consumer subsidies via energy retailers; price premiums; tax credits; tax exemptions, allowances, exclusions and deductions; tax rate relief; tax deferrals; preferential treatment in local rates and franchise fees; provision of infrastructure, such as land expropriation for roads and plant sites; provision of complementary services; government research and development expenditures; preferential loans; loan/liability guarantees; debt forgiveness; price regulation; procurement policies; export credits; and import/export tariffs/quotas.

15. **Action: Target Government Energy Subsidies for Poor and Low-Income People**. Some have referred to the social impact of ending economic subsidies for unsustainable forms of energy as a reason not to end them. But studies have shown that most consumer subsidies assist not the poor but the comparatively wealthy, the biggest consumers of energy. The social goals of government subsidies to consumers can be achieved, in a much cheaper manner, by government subsidies specifically targeted to the poor and low income.

16. **Action: Re-direct Funding into Incentives for Sustainable Energy**. From the monies saved from phasing out harmful economic subsidies, governments and intergovernmental institutions should fund programmes and incentives to promote sustainable energy. Economic growth would also be stimulated more sustainability if those subsidies were given instead to conservation efforts and producers and consumers of sustainable forms of energy.

17. Some governments that are pushing for competitive market reform and pricing in developing and transitional economies are the same governments that annually provide huge amounts of subsidies for unsustainable forms of energy. In fact, there would be a truly competitive market situation only if governments and intergovernmental institutions now gave similarly huge amounts of subsidies over the next 50 years in support of solar, wind and other sustainable renewables, equal to the enormous cumulative value of subsidies given to unsustainable nuclear power, fossil fuels and large-scale hydropower worldwide over the past 50 to100 years.

18. **Action: Support Internalisation of External Costs in All Energy Policy and Pricing Decisions**. External costs should be internalised in all energy policy and pricing decisions. The

price of conventional energy, already deflated because of economic subsidies, rarely reflects the further economic costs due to the negative health, environmental and social impacts resulting from the production and use of unsustainable energy, such as fossil fuels, nuclear energy, and large-scale hydropower. When one takes into account the external health, environmental and social costs, hydrogen fuel cells powered by solar energy; tidal and wave energy; solar thermal electricity; and other allegedly "expensive" renewables, are in fact already much cheaper.

19. **Action: Support Sustainable Forest Management and Restoration**. The forests sector is an especially important one, because of its impact upon ecosystems and biodiversity. To decrease the negative impacts of fuelwood use, sustainable forest management and restoration, and equitable access to and distribution of the benefits of such management, should be supported. These are necessary strategies to meet basic needs until people now using wood for fuel can achieve access to more sustainable forms of energy

20. **Action: Support Projects Focusing on Rural Areas Lacking Modern Energy Access**. Sustainable energy projects should focus on low-income rural areas that lack modern energy access. Investments could be maximised in such areas, and these projects could alleviate poverty and promote capacity building and training as well as direct income generation. Examples of such rural projects include sustainable energy systems to pump water for drinking and irrigation; to power schools and small businesses; to power computers for farmers to receive information about weather, crops, and nearby markets; to light homes for children to read at night; to power clinics or to refrigerate medicines to support rural health; and to electrify rural schools at night, converting them into community centers for adult education and training.

21. **Action: Support Prioritising Cooking Energy and Women's Health in Developing Countries**. Because cooking is the main energy use by poor women, programmes to improve energy access by women and children in developing countries should place a priority on more sustainable cooking fuels and methods, including improved biomass stoves. This could improve family health, both by reducing smoke and other indoor air pollution, and by decreasing women and children's workload in fuelwood collection and cleaning.

22. **Action: Support Micro-credit and Credit Exchange Programmes to Integrate Sustainable Energy and Poverty Alleviation**. Micro-credit and credit exchange programmes that integrate sustainable energy projects with poverty alleviation should be strongly supported. Micro-credit projects are working in many places as proven, low-cost, low-risk methods of increasing sustainable energy access while reducing poverty. Such projects can directly generate income, e.g., solar or small wind water pump systems that could increase cash crops or animal husbandry for a village cooperative. Credit exchange programmes also have great potential. For instance, solar systems can be paid for in installments with export quality handicrafts that are made using lighting at night from the electricity provided by the solar systems. After the solar systems have been paid for, their use can generate new income for the family or community.

23. **Action: Support Sustainable Energy Education and Training to Increase Access**. Human resource capacity must be developed in all energy-related institutions. Public programmes to educate people about conservation and the efficient usage of energy should be intensified. School curriculums at all levels should include sustainable energy education. Training institutes should be established specialising in sustainable energy in both rural and urban areas.

24. **Action: Support Use of Sustainable Renewables for Remote Locations Instead of Extending Unsustainable Grids.** The costs of extending electrical grids powered by unsustainable forms of energy are usually the same or higher than supplying most remote areas with home systems and mini electrical utility systems powered by sustainable forms of energy, such as solar, wind, or micro-hydro. In these cases, governments should simply not extend the grid and instead use available funds to install sustainable energy systems, and train local rural energy service companies in their use and maintenance. In addition to uses that directly support rural development and poverty alleviation, sustainable forms of energy such as solar and wind energy are also proven technologies to provide reliable power for a variety of uses in areas not connected to the grid: water conservancy systems, railway and road lighting and signals, communications, geological and meteorological equipment and stations, etc.

25. **Action: Support Strategies to Increase Access in Grid-Connected Areas.** Support should be given to various strategies to increase access to sustainable energy in grid-connected areas,

such as green pricing, renewable portfolio standards, and net metering. Green pricing programmes involve utility companies offering consumers a choice of paying somewhat higher prices for energy from "green" sources. Renewable portfolio standards (RPS) mandate a certain minimum level of renewables in the portfolios (energy mix) maintained by utility companies. In net metering, unused energy produced by residential or commercial renewable energy systems is returned to the grid, resulting in a credit to the consumer. Meanwhile, the consumer draws energy from the grid when needed (e.g., when sun or wind is lacking). Net metering reduces the need for b: :ries and expensive energy storage systems.

26. **Action: Support Establishment of an International Sustainable Energy Organisation (ISEO)**. From the monies saved by ending harmful energy subsidies, governments of industrialised countries should utilise half to finance sustainable energy programmes in their own countries. They should contribute the other half to finance the establishment and functioning of a temporary new United Nations agency, to be called the International Sustainable Energy Organisation (ISEO). ISEO would have a term of ten years, and could be extended for further ten-year terms as needed. ISEO would have four tasks:

(a) Assist countries in identifying and phasing out government subsidies for unsustainable forms of energy;

(b) Assist countries in integrating external costs in energy policy and pricing decisions;

(c) Fund conservation and sustainable energy programmes in developing countries, and especially focus on providing sustainable energy access for the poor and low-income in rural areas, and on assisting all developing countries to diversify into sustainable forms of energy;

(d) Disseminate information on sustainable energy policies and practices, and facilitate international technology transfer, cooperation and capacity building for sustainable energy.

Topic 2: Sustainable Choices for Producing and Consuming Energy

27. **Action: Support Sustainable Planning, Design, Construction, and Maintenance/ Operations**. The most sustainable choice for producing and consuming energy is to prevent its consumption in the first place. The best way to achieve this is by sustainable "green" planning,

design, construction, and maintenance/operations of all built environments; residential, industrial, and commercial equipment, machinery, and furnishings; and consumer appliances and products. Governments and intergovernmental bodies should work with civil society to set standards for sustainable design and construction. This conservation strategy has maximum sustainable impact at zero or low initial cost, and almost immediate monetary savings.

28. **Action: Support Energy Conservation Strategies and Methods in all Sectors**. Energy conservation and efficiency strategies, methods, and technologies, such as demand side management, should be applied in all sectors that consume energy, e.g., industry, agriculture, commerce, housing, transport, consumer products, water supplies, waste disposal, government and military installations, etc. Substantial monetary savings as well as energy would be saved.

29. **Action: Support Energy Conservation by Use of Alternative Options in Other Sectors**. In all sectors, conservation can also be achieved by using alternative options, which are often quite cost effective as well as environmentally benign. For instance, a study on solid waste prevention showed that it cost U.S. $150 per ton to landfill; $250 to recycle; $300 or more to incinerate; but only $20 to prevent or reduce one ton of waste. Waste prevention would therefore eliminate altogether the significant energy use in the three conventional methods of waste disposal. Similarly, encouraging organic farming and less reliance on petrochemicals in agriculture would reduce energy consumption, and ecological means of wastewater treatment would consume much less energy than the equivalent chemical wastewater treatment plants.

30. **Action: Support Training of Architects in Passive Solar Design for New Buildings**. Passive solar design involves maximising the use of energy from the sun by the way a building is designed, including building orientation, solar use of certain building materials, "solar" landscaping, placement of windows, etc. Using passive solar design can achieve as much as 80 to 90% reductions in energy use for heating, lighting, ventilation and cooling the building. Small investments in training architects, especially in developing countries, in this technology can produce large savings in energy and energy expenditures at little or no financial cost.

31. **Action: Support Investments in Energy Conservation and Efficiency Instead of New Power Plants**. Each time a new power plant is being considered, cost-benefit analyses should be done to consider whether the potential investments would receive a better return if they were instead used for energy conservation projects. For instance, utility companies could establish additional energy services companies to do energy audits and sell energy conservation and efficiency products such as low-wattage compact fluorescent bulbs to consumers.

32. **Action: Support the Most Sustainable Renewable Energy Strategies and Technologies**. After reducing energy requirements through conservation, remaining energy needs can be supplied by sustainable renewable forms of energy. Some of these, notwithstanding the relative lack of subsidies, are already cost-effective in all or certain circumstances: solar cookers; wind mechanical water pumps; windpower for electricity on and off-grid; solar photovoltaics (PV) for electricity and agricultural uses in remote areas; hybrid wind-solar; solar collectors for heating and hot water; biogas; and micro-hydro and pico-hydropower.

33. **Action: Support Dissemination and Training in Use of Low-Cost Solar Cookers**. Inexpensive solar cookers can be designed and constructed locally for a variety of uses in addition to cooking: water purification, crop drying, desalinisation, etc. Solar cookers have no harmful pollutants and can free women to do productive activities near the cooking. Cookers made locally of indigenous materials are the most sustainable, and are ideal for cooking staples such as rice, beans, yams, potatoes, etc. The small financial investments required for constructing cookers and training users should be widely supported.

34. **Action: Support Dissemination of Wind Mechanical Water Pumps**. Wind mechanical water pumps, an old technology, have recently been updated. New wind mechanical water pumps can now pump very deeply, while running on low wind speeds. For instance, one new kind of advanced wind powered mechanical pump can run at 5 m/s, at a depth of 30 meters, and pump water at the rate of 240 liters/hour, enough to supply a small village with clean water plus extra water for income-producing activities.

35. **Action: Support Dissemination of Modern Wind Turbines for Electricity**. Electricity from modern wind turbines is now cost-competitive with fossil fuels, with costs per kWh as low as U.S. 3 to 4 cents. When appropriately sited, small and large-scale wind turbines are suitable for both industrialised and developing countries. New wind technology includes very powerful turbines that are becoming smaller in size while operating with increasing efficiency. The "Windforce 10" campaign has shown that wind energy can provide 10% of the world's energy by the year 2020, and should be strongly supported.

36. **Action: Support Dissemination of Solar Home Systems (SHS) for Off-Grid Areas**. Complete small solar home systems, including 50 watt photovoltaic (PV) panels, battery, controller, lights, wiring, and installation, at a cost of less than U.S. $500, are selling well in many developing countries. Needing little maintenance, often with warranties of 10 to 20 years (although the PV panels can last even longer than 100 years), such systems are providing electricity and promoting income-producing activities. Typically, rural energy service companies (RESCOS) rent or sell such systems on credit at a charge of U.S. $10-15 per month.

37. **Action: Support Dissemination of Hybrid Wind/Solar PV Systems**. Hybrid wind/solar systems can be the ideal sustainable solution to areas with inadequate solar irradiation, but which have strong winds in the evening. Storage batteries may therefore not be necessary, decreasing the cost of a hybrid system compared to using only wind or solar energy. New, easy-to-use computer programs take into account more detailed wind and irradiation data and allow almost anyone with a computer to design the most cost-effective custom hybrid system possible.

38. **Action: Support Dissemination of Solar Collectors for Heating and Hot Water**. Solar collectors for heating and hot water are an established technology, produced locally in many developing countries. Mass production of solar collectors has reduced costs, to such an extent that rooftops of cities with nearby solar plants will often be covered with solar collectors. The costs situation has also improved in several European countries.

39. **Action: Support Dissemination of Sustainable Biogas Systems**. Certain kinds of biogas systems are fairly sustainable. Biogas produced by anaerobic digesters at low temperatures using

wastewater effluent or other residues from agriculture are being utilized in both developing and industrialized countries, in residential, commercial, and industrial sectors. The resulting biogas is used for cooking fuel, heat, or generating electricity.

40. **Action: Support Micro-Hydropower and Pico-Hydropower**. Micro-hydropower (1 kWe-100 kWe) and especially pico-hydropower (less than 1kWe) are the most sustainable forms of hydropower, with almost none of the negative environmental, social, and health impacts of large-scale hydropower systems. However, costs vary considerably, and they require careful site determination and planning (e.g., consistent water flow, etc.) to achieve a successful project.

41. **Action: Support Decentralised Energy Cogeneration**. Systems for cogeneration of heat and power (CHP) have become more efficient. Cogeneration is cost effective because two types of energy are generated by one system, and can often reduce wastes substantially from industrial plants. Cogeneration also promotes sustainability by allowing smaller, more decentralised energy systems that can use different types of renewables depending on the situation.

42. **Action: Support Production and Use of All Kinds of Sustainable Renewables**. If economic subsidies for unsustainable forms of energy are taken into account, many other sustainable energy strategies and technologies are already cost-competitive and should be supported where possible: ambient heat flow pumps, solar thermal electricity, geothermal energy in appropriate locations, tidal and wave energy, building-integrated photovoltaics, fuel cells powered by sustainable forms of renewable energy, etc.

Topic 3: Public-Private Partnerships to Achieve Sustainable Energy for Transport

PROBLEMS

43. **Motorisation.** Rapidly increasing motor vehicle use remains the biggest challenge to developing sustainable transportation systems. Industrial nations, while accounting for less than a fifth of the world's population, continue to account for about 60 percent of transport-related energy use. Vehicle ownership rates are still on the increase in all OECD countries. Growing

vehicle sizes and miles traveled have overtaken fuel efficiency gains. These countries therefore bear a special responsibility for reducing transport-related emissions and energy use.

44. However, motorisation growth rates are presently highest in less industrialised countries (LICs). While petrol use in industrialised countries is growing by 1% per year, it is growing by 6% in Asia and Latin America. This growing motor vehicle use is only partially offset by the modernisation of old polluting vehicle fleets with newer, cleaner, more fuel-efficient vehicles. Motor vehicle use is much greater than optimal because fuel, road space, parking, and other facilities are frequently heavily subsidised, while the external costs they generate are not internalised. Further, many trips short enough to be made by walking, cycling or other non-motorised modes are made by motor vehicle due to poor road safety conditions.

45. In the last two decades, the role of the public sector in transit provision and low income housing has declined. Growing private sector involvement is a response to both fiscal and managerial problems within public systems. Governments have sometimes pursued privatisation of transit systems to undermine unionised labour, while doing little to improve bus system efficiency. Public transit's share of passengers has declined precipitously in virtually all cities where transit vehicles have not been given priority access to the road network, regardless of whether the systems are in public or private hands. As public bus services deteriorated, they have sometimes been replaced by weakly regulated paratransit services with few worker protections.

46. Cutbacks in state support for low-income housing have pushed the poor to build self-help housing in remote locations locking the poor into long term dependency on motorized travel.

47. New mechanisms for public and private cooperation should allow the reassertion of public control over the urbanization process in a context of regulated private provision.

48. **Transport-related Emissions.** The transport sector represents nearly 30 percent of total emissions of carbon dioxide, the primary contaminant responsible for global climate change. Further, with rapid growth in motor vehicle use in the developing world, the sector is also the

fastest growing source of greenhouse gas emissions. Unfortunately, none of the over 150 AIJ mitigation projects developed have been transport related, and GEF funding in the sector is only now beginning.

49. From the standpoint of human health, other emissions are of greater concern. Levels of lead, suspended particulates (TSP), nitrogen oxides (NOx), ground level ozone, carbon monoxide (CO), and volatile organic compounds (VOCs) are rising sharply in many developing country megacities, causing serious health problems. Leaded gasoline remains a major problem in Africa, Asia and Latin America, thought its phase out is well under way in many developing and virtually all developed countries. An estimated 1.1 billion urban residents worldwide are exposed to TSP levels in excess of World Health Organization (WHO) recommendations.

50. Most tailpipe emission controls, ambient emission controls, and fuel and fuel efficiency standards in developed countries were implemented in the face of initial opposition from the motor vehicle industry. Cleaner technologies will play a role in emission reduction, but are no panacea. Hydrogen-fuel cell vehicles may become viable, but life-cycle CO2 emissions from fuel cells are currently higher than for natural gas vehicles. The emissions from electric vehicles depend on how the electricity is generated. Adoption of these new technologies in developing countries, and most importantly the fuel distribution supply infrastructure, will remain prohibitively expensive. Supplies of these alternative fuels and vehicles are also likely to be monopolistic in the short term. Setting a regulatory framework and targets based on energy efficiency and public health, then allowing the private sector to meet these targets in the most economically viable way is better than having governments and development agencies second-guess which technologies will best meet these targets and pour scarce resources into their development.

51. Aviation is the mode with the largest emissions increases in the last decades. Global air passenger traffic already exceeds 2.6 million passenger traffic miles per year. Air travel is more energy intensive and emits more CO2 per passenger mile than most other form of travel. International agreements continue to prevent the taxation of jet fuels, presenting a de facto subsidy to this unsustainable mode. UN agencies responsible for regulating international air

travel are dominated by corporate interests. Airports and civil aviation have received a disproportionate share of financial support and technical assistance from IFIs and UN donor agencies given this mode serves no low-income people and generates enormous pollution with virtually no emission controls.

SOLUTIONS

52. **Curbing Motorisation.** The first priority is to remove the public subsidies, which disproportionately benefit high income private motorists at the expense of public transit passengers, pedestrians, and cyclists of more moderate means. Fuel prices vary globally by a factor of 100, ensuring that there is nothing rational about the level of aggregate demand for oil. Increasing fuel prices and taxes is thus a key priority. Increasing charges for urban parking and road use in congested areas are the second priority.

53. For such policies to succeed politically, the poor and middle class must be insulated from adverse effects. Critical to this is creating safe and pleasant environments for anyone wishing to walk or bicycle. Most people want to own a motor vehicle, but they also want to live in safe pollution free communities, and shop in a pleasant environment free of traffic and pollution. As, tourism and services are the growth sectors of the global economy, while the motor vehicle industry is part of the old, heavy industry-based economy, the economic importance of liveable cities is increasing. This is creating more opportunities for cooperation between NGOs and these new economic sectors for pedestrian and bicycle-friendly downtown revitalization efforts. Modernization does not necessarily mean motorisation, and the overarching goal must be to move people rather than vehicles.

54. Effective, affordable and attractive public transit is also critical to reducing dependence on private motor vehicles and subsidized oil. Most experts agree that either transparent and effective public control (as in many developed countries) or private competition for the transit market established by local authorities based on user needs, are the best mixes of public and private control. Local authorities are increasingly using service quality, safety, and tailpipe emissions standards as criteria for awarding contracts to public or private operators competing for routes.

Public capital investments to clean up even private bus fleets can be made rewards for good private service delivery.

55. Modernization does not necessarily mean motorisation, and the goal must be to improve people's access to services and jobs, rather than the movement of vehicles.

56. **Reducing Transport-Sector Emissions.** Hopes for reducing global transport sector emissions ..ould not be placed on the voluntary commercial adoption of unproven and difficult to disseminate high-technology solutions, such as hydrogen fuel cells and other alternative fuel technologies. Where markets are developing for these technologies, they are being driven by regulatory requirements. Given the proven inability of public agencies to "pick-winners," public authorities and international agencies should place their emphasis on developing fuel efficiency targets, enforcing global minimum tailpipe standards, (perhaps based on EURO II), global minimum fuel standards, and global minimum ambient air quality standards (perhaps based on WHO guidelines). Decisions about which technologies will prove to be the most commercially viable should be left to the private sector. A stronger justification exists for public support of technological innovation in human powered vehicles than for unproven alternative fuel technologies. As these modes are predominantly used by the poor the profit margins on these vehicles are low, and the manufacturers and consumers risk-averse, technological innovation tends to stagnate, undermining the ability of these non-polluting modes to compete with motorized modes.

ACTIONS AND PARTNERSHIPS FOR CHANGE

57. **Actions for UN and International Development Institutions:**

(a) Support an international tax of jet fuels earmarked to environmental clean up.

(b) Set up a process to develop and encourage the adoption of global minimum standards for tailpipe emissions, including those for motorcycles and three wheelers.

(c) Set up a process to develop and adopt global minimum ambient air standards.

(d) Provide technical support for local/national governments to enforce these standards.

(e) Support downtown revitalisation efforts, focusing on pedestrian friendly environments.

(f) Technical support for public transit and non-motorized transport prioritisation.

58. **Actions by Governments:**

(a) Eliminate fuel subsidies and charge appropriately for parking, road use and other car-based services, as well as environmental and safety externalities.

(b) Agree on the implementation of a global phase-out of leaded gasoline, and the global phase-out of highly polluting two-stroke motorcycle engines.

(c) Agree on ambient air quality standards based on WHO minimum standards.

(d) Manage demand for road space by private motor vehicles, rather than accommodating it.

59. **Actions by Private Sector:**

(a) Work with governments to ensure a transition to lead-free fuels & low-emission vehicles.

(b) Develop standards for safer car, bus and truck fronts and side panels, more visible (for bicyclists and pedestrians) turn indicators and develop safer designs for locally used vehicles in LICs (e.g. Tuk-tuk, jeepney, three-wheeled scooter taxi, etc).

(c) Support the development of global fuel standards and tailpipe emission standards so that companies cannot use lower emissions standards to compete on cost.

(d) Develop partnerships for downtown revitalization and pedestrianisation.

(e) Form strategic partnerships with NGOs to use, modernize and promote human powered and fuel efficient delivery vehicles, public transit prioritisation, increased parking fees, and congestion pricing.

(f) Use non-motorized and clean delivery and trucking services.

(g) Encourage employees to carpool, vanpool, bicycle, or use public transit by giving transit vouchers, and comply with tailpipe standards.

(h) Invest in green transportation technologies.

60. **Actions by NGOs:**

(a) Press governments, international agencies, and private corporations to implement the above recommendations.

(b) Create users groups for pedestrians, cyclists, and public transit riders to push for better services and represent their interests during transportation planning and budgeting processes.

(c) Build public awareness of sustainable transport issues.

Topic 4: Sustainable Transport Planning: Choices and Models for Human Settlements and Vehicle Alternatives

PROBLEMS

61. **Land Use.** Transport is a derived demand. Co-locating housing, jobs, and shopping can remove the need for a motorised trip into perpetuity. Land use regulation in the past created obstacles to mixed-use activity centres. Zoning, generally controlled at the local level, is primarily used to protect the property values, rather than to promote higher density, compact, transit-focused development which would greatly reduce energy consumption and emissions. With transport and other infrastructure costs borne by the state, developers take advantage of lower land costs at the urban periphery, dramatically increasing motor vehicle use. Land use regulation has rarely proved an effective way to change this. Withdrawal of the state from the housing and transit sectors further reduced the state's ability to intervene in this process.

62. **Traffic Safety and More Sustainable Travel.** In many cities a majority of trips are under 5km, and could easily be made by walking or cycling, but they are made by private motor vehicle even in poor neighborhoods, because of disastrous road safety conditions. In 1999, an estimated 1.171 million people died in traffic accidents. In countries like India, as little as 5 percent of those killed are in cars. Children and elderly pedestrians, cyclists and motorcyclists remain the most vulnerable road users. Traffic engineers have focused on increasing vehicle speeds rather than safety.

63. Trips by walking, bicycling, and public transport, (which involves a walking trip on either end), will never increase unless traffic planners can guarantee that these trips can be made safely. Parents will not allow children to use public transport if they have an unsafe walk to a bus stop. Elderly people and women, often unable to drive, are forced to stay home and become socially isolated.

64. While ultra-light vehicles have made possible dramatic improvements in fuel efficiency, families worried about safety are buying ultra-heavy vehicles, compromising fuel economy.

65. **Equity.** While the vast majority of the global population depend on walking and head-loading and will never own a motor vehicle, less than 2% of development investments benefit these modes. This mobility burden has kept many of the world's women locked in poverty.

66. Although cycle rickshaws and vending carts play a critical role providing jobs and transport services in many lower income countries, particularly for women and the elderly, governments continue to restrict their use. Such restrictions cannot be justified from a traffic management perspective.

67. The ability of women, elderly, ethnic and racial minorities, and disabled people, to meaningfully participate in society require access to employment opportunities and critical services. Women spend a disproportionate share of their day meeting basic household needs. Disabled and elderly people are unable to participate meaningfully in society and have access to critical services if their particular mobility needs are not addressed.

68. **Infrastructure Investment-Decision Making.** The prioritisation of transport sector investments is rarely based on rational economic or environmental criteria. New roads are built while old roads crumble in defiance of economic rationality. Highways and high-speed rail lines are built connecting powerful political constituencies, while roads in low-income areas remain made of mud.

69. Traffic planning and cost benefit analysis, when used, generally ignore non-motorised travel, leading to measures which improve motor vehicle speeds but compromise the safety and convenience of pedestrians and cyclists. In developing countries in particular, this bias tends to disproportionately hurt lower income groups and women. Cost benefit analysis rarely considers the precautionary principle that avoids plans or projects, which present serious risks to the environment, public health, and safety. Lower cost alternatives to new construction, such as traffic demand management measures, are rarely considered. The impacts of induced demand are also rarely included in the analysis.

70. **Pricing Issues.** While governments and development agencies are loathe to provide direct capital subsidies for public transit, wheelchairs, bicycles, wheel barrows, and draft animals that would directly benefit low income populations, they are willing to spend billions on highway infrastructure and fuel and parking subsidies that disproportionately benefit wealthier people with access to motorised vehicles.

SOLUTIONS

71. **Promoting Sustainable Land Use and Compact Cities.** Governments can actively promote compact, mixed-use city centres. European governments refuse to grant building permits in auto-dependent locations when more central locations better served by transit remain available. Municipalities and state governments can refuse to provide the necessary infrastructure at sub-optimal sites. German, English, and Dutch governments, which have used these powers, have saved billions for their taxpayers. Government involvement is often required to facilitate higher density development in more central locations, but the necessary government institutions to facilitate this process in developing countries need to be nurtured. Governments need to become more involved in higher density, accessible housing development, creating mechanisms where housing vouchers and one-off capital grants can be applied to higher density housing as well as rehabilitating existing housing stock. Land banking coupled with low income housing creation around planned public transit corridors has also effectively reduced travel demand in Singapore, Hong Kong, and Curitiba. Private banks and development banks could also encourage the recent development of "location-efficient mortgages."

72. Ring roads, ostensibly built to facilitate "through-traffic," make sense for small cities, but in large cities, tend to primarily subsidise out-of-town auto-dependent big box retailers, at the expense of smaller scale retailers in the centre.

73. **Improving Traffic Safety.** The safe use of road facilities by all types of traffic should be the basic design principle for roads and intersections, rather than the maximization of motorized traffic speeds alone. Sweden has made "zero fatalities" the primary guiding principle of transportation planning. The US FHWA has made safe use of road facilities by all types of traffic, both motorised and non-motorised, a critical design criteria. Extensive traffic calming

design standards have been developed that should be more widely adopted. Traffic safety improvements should initially prioritise access to schools, traditional markets, transit stations, and major employment centres for lower income people.

74. The vehicles themselves should also be subjected to design standards which ensure the safety of passengers both in other vehicles and pedestrians and cyclists. Truck and bus front-ends can be designed to minimize the severity of such injuries.

75. Governments and courts could criminalize manufacturers of vehicles with designs known to have adverse safety consequences for vulnerable road users. WHO could develop vehicle design guidelines to provide advice to governments. Weight restrictions could be imposed on passenger vehicles, and tightened on commercial vehicles allowed to operate in urban areas.

76. Road and highway design standards need to be developed in all countries which ensure safe operation by non-motorized as well as motorized traffic on all but limited access freeways. Courts could hold municipalities liable for non-compliance with these standards in the event of serious accidents.

77. **Boosting Public Transport.** An exclusive right of way for public transit vehicles, transit prioritisation at controlled intersections, pre-boarding facilities, fare structures encouraging multiple use, low-floor, wide-doorway buses, and a host of other factors have proven to increase public transit usage, whether implemented by a private or public operator. Curitiba, Brazil, Quito, Ecuador, and now Kunming, China are successful examples. More modest examples also exist throughout the US and Europe. Such bus-system focused improvements are much cheaper than metro or light rail improvements, which should only be implemented in high-density corridors once bus-system needs and improvements have been addressed.

78. All public transit facilities should be accessible to the elderly, the disabled, and women and men with children. Transit systems should also provide secure bicycle parking facilities, especially in suburban areas with lower station densities, and should facilitate safe access by non-motorized means.

79. **Boosting Non-Motorised Transport.** In addition to the safety measures suggested above, governments need to remove restrictions on the use of cycle rickshaws and bicycles on major urban roads serving short distance trips. Facilitating movement by wheelchair is also critical to enhancing the mobility of the disabled and the elderly. Governments could also provide one-off capital grants, and micro-credit to increase non-motorized vehicle ownership. Business training and other small and medium enterprise support could be provided to support the emergence of the bike retail sector.

80. The development of national and city-level bicycle masterplans would be another critical element in boosting cycle use, as is done now in Seoul, New York, Bogotá, and many other cities. In order to be effective, these plans should pro-actively aim at a significant increase of the non-motorised mode share for utilitarian trips, and not be targeted at recreational cycling.

81. Non-motorised transport should also be integrated into all transportation planning, beginning with the collection of basic data on non-motorised travel and non-motorised vehicle ownership in all household surveys and road traffic counts. Such planning activities should be driven by a process of public participation in which transit users, service providers, and local officials work together to develop sustainable transport solutions.

82. **Increasing Equity-Responsiveness.** The impacts of transport investments and service arrangements on women, the elderly, and the disabled in particular need to be studied and considered before project implementation. Disaggregated analysis of these different types of users is a necessary part of a general re-orientation of transport planning away from a focus on facilitating the movement of motorised vehicles to a people-centred perspective that starts with an analysis of the basic household mobility needs.

83. **Making Infrastructure Investment-Decisions More Sustainable.** Only at the strategic planning and policy-making level is it possible to still consider modal alternatives. The goal of transport and traffic planning should be reaching traffic safety and environmental targets, as well as the more traditionally measured economic goals such as increased motor vehicle speeds and

reduced operating costs. Such analysis must include the impacts of proposals on non-motorised traffic and on other modes in the same corridor. The project should be a pre-approved project evaluated in an overall strategic environmental impact assessment for the region. Alternatives analysis should still be performed to determine whether or not the same access needs could not be better met at lower cost by traffic demand management measures or improvements in public transit systems. New infrastructure investments should be considered only after basic maintenance of all existing systems has been addressed.

84. **Getting the Price Right.** The full health, environmental, and economic costs of transport should be reflected in all prices within the transport system. Subsidies to users should only be provided when justified to reduce poverty, improve access to disadvantaged groups, promote more environmentally sustainable modes, or to compensate for existing subsidies in favour of less environmentally sustainable modes.

ACTIONS AND PARTNERSHIPS FOR CHANGE

85. **Actions for UN and International Development Institutions**

(a) Require data collection and analysis by governments of project impacts on non-motorized travel as a prerequisite for project funding.

(b) Provide necessary technical support.

(c) Initiate a multi-national task force on vehicle and road safety design standards.

86. **Actions by Governments**

(a) Promote mixed-use development, downtown revitalisation, and accessible low income housing.

(b) Develop land use regulations that prioritise the development of existing brownfield sites in central or transit-accessible locations and restrict big-box greenfield development.

(c) Make cities pedestrian and car-friendly, and wheelchair accessible.

(d) Promote car-free days.

(e) Move towards requiring Strategic Environmental Assessments (SEA) for major transport plans, policies and comprehensive investment projects.

(f) Develop and implement guidelines for urban road and intersection designs and traffic calming for country specific traffic patterns.

(g) Collect all household and user surveys in a sex-disaggregated manner to facilitate gender analysis.

(h) Increase the penalties for causing road traffic accidents.

87. **Private Sector Actions**

(a) The bicycle industry should become much more involved in working with governments to improve safety conditions for bicyclists.

(b) Develop voluntary standards for safer car, bus and truck fronts and side panels, more visible (for bicyclists and pedestrians) turn indicators and develop safer designs for locally used vehicles in LICs (e.g. Tuk-tuk, jeepney, three-wheeled scooter taxi, etc).

88. **NGO Actions**

(a) Organize users to participate meaningfully in the transportation planning and implementation process.

(b) Participate in programs to improve the access of disadvantaged groups to modes of transport, which directly improve their access and mobility.